

Scalars 2023

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Supergeometric Scalars and Fermions

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Content :

I will first review the covariant and differential geometric methods in the construction of Quantum Field Theories, where the fields are treated as coordinates of a field-space manifold. Although the geometry of bosons on such manifolds was well understood, I will then explain how the inclusion of fermions was obstructed by a number of theoretical difficulties and limitations. I will show how in addition to scalars, the QFT description can be extended to a supergeometry on supermanifolds, so as to include fermions. These SuperGeometric QFTs (SG-QFTs) that emerge from such considerations have a number of interesting properties that are reflected in the effective action, including the possibility of a non-zero fermionic curvature. Hence, SG-QFTs appear very promising for a complete geometrisation of realistic theories of micro-cosmos, such as the Standard Model and its gravitational sector.

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